Bayonne Barrel and Drum Site - Sampling and Analysis Plan

Bayonne Barrel and Drum
PRP Group/de maximis, inc.
Newark, New Jersey

November 1996

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

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1. Introduction

Implementation of the sampling and analytical activities outlined in this Sampling and Analysis Plan (SAP) will verify and supplement existing data and accomplish the following general objectives:

- Further characterize the surface and subsurface soils associated with the Bayonne Barrel and Drum facility;
- Characterize the soils in certain locations not previously sampled; and
- Assist in determining an appropriate remedial action for the site.

This SAP is organized into three sections, with accompanying tables, figures and appendices. Section 1 provides a brief introduction to the project activities and description of the site. Section 2 details the proposed sampling activities and the sampling and field procedures to be utilized. Section 3 presents the sample handling, packaging, and shipping procedures. Laboratory and applicable Quality Assurance/Quality Control (QA/QC) procedures for the collected samples are discussed in a separate document entitled the Quality Assurance Project Plan (QAPP) [Blasland, Bouck & Lee (BBL), November 1996]. A site-specific Health and Safety Plan identifying the health and safety procedures, methods and requirements for activities to be performed during the investigation has been prepared [and submitted to the United States Environmental Protection Agency (USEPA) on October 28, 1996] and will be followed for the activities described.

1.1 Site Background

The Bayonne Barrel and Drum Site (site) occupies approximately 15 acres of land located in an industrial area of Newark Essex County, New Jersey (Figure 1).

Bayonne Barrel and Drum operated as an unlicensed treatment, storage, and disposal (TSD) facility from the early 1940s until the early 1980s when the company filed for bankruptcy under Chapter 11. When the facility was in operation, drum cleaning operations involved both open and closed-head drums. Drums were washed with a caustic solution which was drained through an oil-water separator before being discharged to a 50,000 gallon underground storage tank. The liquid was decanted from the tank into the sewer system. An incinerator then was used to clean the open head drums, the incinerator residue was collected in two pits (approximately 14 feet deep) on either side of the incinerator.

In March, 1993, USEPA conducted activities to remove material displaying the Resource Conservation and Recovery Act (RCRA) characteristic of ignitability contained in abandoned trailers. Following a fire at the site on July 8, 1994, USEPA commenced additional site inspection/characterization and removal activities. Inspections at the site revealed ash piles, shredded tires, contaminated vertical and underground storage tanks, contamination within buildings and the presence of a then estimated 45,000 drums, some containing hazardous substances. Many of the drums containing materials were open, severely deteriorated and/or improperly stored. Removal activities conducted to date include, but are not limited to:

1. Securing the site with measures such as repairing the perimeter fence and installing warning signs;
2. Removal of approximately 46,000 drums, some containing hazardous substances;
3. Testing, segregating, and over packing of hazardous substances;
4. Removal of two ash piles contaminated with dioxin and lead;
5. Removal of tanks containing contaminated sludge.

Recent sampling of Site soils has confirmed the presence of numerous organic and inorganic hazardous substances, including ethyl benzene, xylenes, polychlorinated biphenyls (PCBs), cadmium, chromium, and lead. In addition, the presence of Polychlorinated dibenzo-p-dioxins/Polychlorinated dibenzofurans (PCDDs/PCDFs) has been confirmed.

1.2 Approach

The Bayonne Barrel and Drum Potentially Responsible Parties (PRP) Group and de maximis, inc. prepared a Conceptual Sampling Plan document (Appendix A) which has been used as the basis for this SAP. The methods and approaches in the Conceptual Sampling Plan were agreed upon by the USEPA and made part of the Administrative Order on Consent Exhibit A, October 1, 1996. This SAP contains detailed field investigation procedures to be utilized during the sampling and analysis of soils at the site. The data obtained from this activity will be used to assist in determining appropriate remedial action for the site. In accordance with the Conceptual Sampling Plan, the soil characterization sampling and analysis efforts will focus on the following three areas: the Yard Area, the Furnace Courtyard Area and the Storage Tank Area.

1.3 Project Objectives

1.3.1 Sampling Objectives

The activities in this SAP will provide the information necessary to evaluate alternative remedies. The objectives of this overall plan are to:

- Identify surface and subsurface soil samples to be collected for characterization;
- Identify the sampling methods to be employed;
- Provide shipping and field chain-of-custody (COC) documentation procedures;
- Identify the types of analyses that will be performed with appropriate USEPA analytical method references; and
- Provide QA/QC objectives and procedures to be followed.

1.3.2 Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions made during site-related activities and are based on the end uses of the data to be collected. As such, different data uses may require different levels of data quality. There are three analytical categories that address various data uses and the QA/QC effort and methods required to achieve the desired level of quality. These categories are:

Screening Data: Screening data [i.e., photoionization detector (PID)] affords a quick assessment of site characteristics or conditions. This objective for data quality is available for data collection activities that involve rapid, non-rigorous methods of analysis and quality assurance. This objective is generally applied to: physical and/or chemical properties of samples, degree of contamination relative to concentration differences, and preliminary health and safety assessment.

Screening Data with Definitive Confirmation: Screening data provide rapid identification and quantitation; however, since screening generally involves the use of less specific methods of analysis with less rigorous sample preparation, the results may be semi-quantitative at best. Generally, at least 10% of the data are confirmed using analytical methods and QA/QC procedures and criteria associated with definitive data. This objective can also be

used to verify less rigorous laboratory-based methods. This objective of data quality is available for data collection activities that require qualitative and/or quantitative verification of a select portion of sample findings.

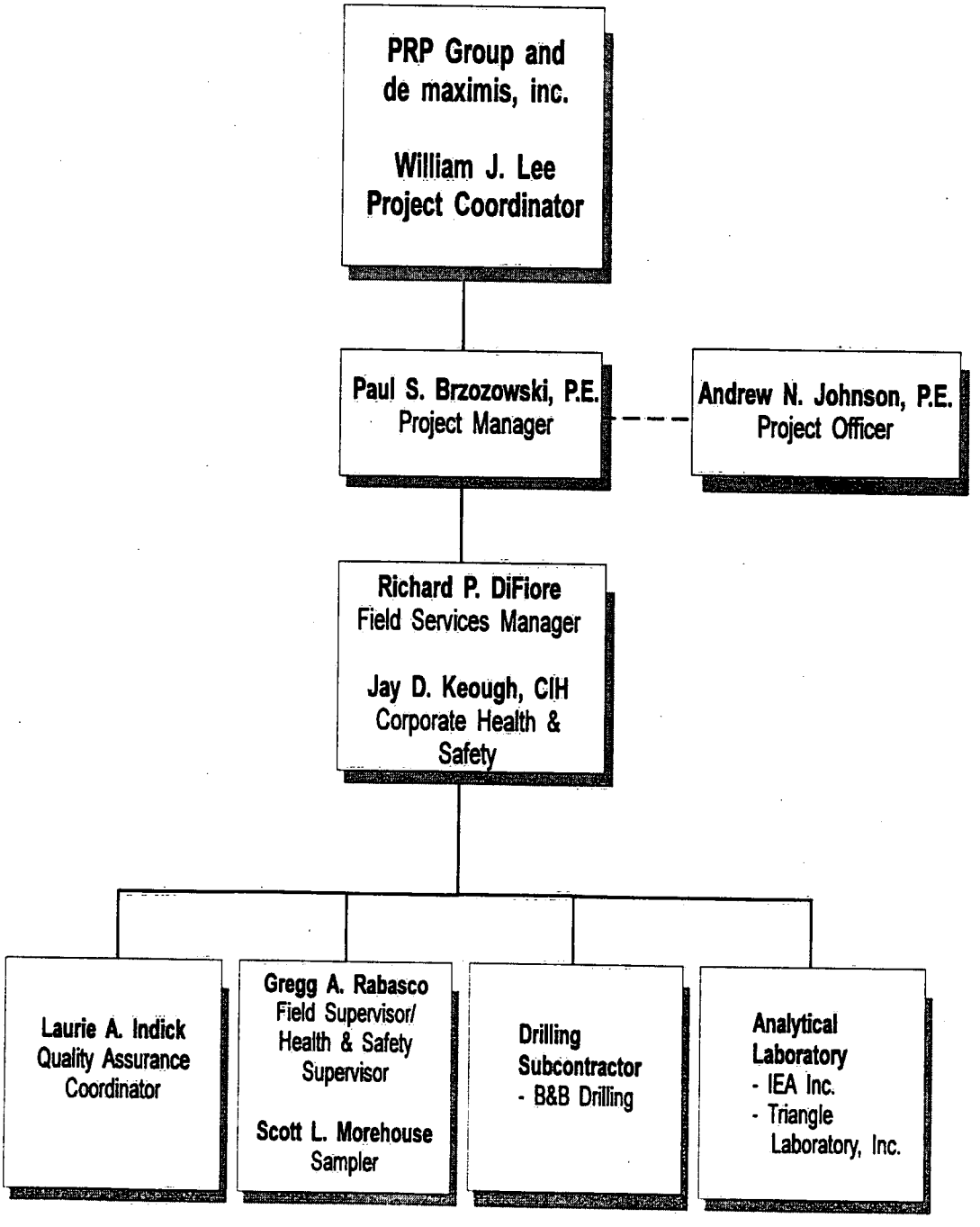
Definitive Data: Definitive data are generated using rigorous analytical methods, such as approved USEPA reference methods. Data are analyte-specific, with confirmation of analyte identity and concentration. Methods produce tangible raw data (e.g., chromatograms, spectra, digital values) in the form of paper printouts or computer-generated electronic files. Data may be generated at the site or at an off-site location, as long as the QA/AC requirements are satisfied. For data to be definitive, either analytical or total measurement error must be determined. Definitive data are used for site characterization, environmental monitoring, confirmation of field data, and to support engineering studies or risk assessments. Definitive data are used for the conformation of lower level data, risk assessment, and to obtain highly documented data.

The Data Quality Objectives and reporting levels for the analytes of interest are summarized in Table 1.

1.4 Project Organization

The Project Organization Chart (presented below) presents the relationships of the various parties involved with the site sampling and material characterization analyses for the Bayonne Barrel and Drum Site. William J. Lee will serve as the Project Coordinator for the Bayonne Barrel and Drum PRP Group and de maximis, inc. Paul S. Brzozowski, P.E., will serve as the Project Manager for BBL. The field sampling team will consist of direction from Richard P. DiFiore and implementation of sampling activities by Gregg A. Rabasco, who will also serve as the Health and Safety Supervisor (HSS). The BBL Quality Assurance Coordinator (QAC) is Laurie Indick. B&B Drilling, Inc. will be subcontracted through BBL to provide drilling services as needed. The analytical subcontractor for this project is IEA, Inc. in Whippany, New Jersey. IEA, Inc. will subcontract Triangle Laboratory, Inc. located in Durham, North Carolina for PCDDs/PCDFs.

Project Organization Chart
Characterization Sampling and Analysis
Bayonne Barrel and Drum Site
PRP Group and de maximis, inc., Newark, New Jersey



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1.5 Project Schedule

The work schedule included below provides a summary of the duration, and where possible scheduled start dates and scheduled finish dates for the activities.

Activity/Milestone	Schedule/Duration
• Submittal of SAP to USEPA	November 6, 1996
• Revisions based on USEPA Comments	Within one week of receipt of comments (dependent on extent of comment).
• Notify USEPA	One week prior to initiation of work
• Initiate Field Work	Within one week of USEPA approval
• Completion of Field Work (includes preparation and demobilization)	Five days
• Receipt of Analytical Data	21 to 28 days upon receipt of samples
• Draft Report to de maximis	Within 45 days of completion of work
• Final Report to USEPA	Within 60 days of completion of work

2. Sampling and Analysis

2.1 Sample Matrices, Locations, Frequencies and Parameters

The sample matrices, frequencies and analytical parameters are summarized in Table 2 and discussed below.

2.1.1 Yard Area

Surface soil samples will be collected to characterize and identify constituents of concern within the Yard Area, which covers approximately 11.5 acres. Five locations will be spatially distributed per acre within the Yard Area for a maximum of 58 sample locations. Discrete grab soil samples will be collected at the 0- to 2-foot interval from each of the designated sample locations. Each sample will be analyzed for PCBs, PCDDs/PCDFs, and lead by IEA, Inc., located in Whippany, New Jersey or their subcontracted laboratory.

A total of five spatially distributed subsurface soil samples also will be collected at five of the locations identified for surface soil sampling. The five locations are shown on Figure 2. At each location, subsurface samples will be collected for analysis from the two-foot interval immediately above the ground-water table and from the two-foot interval representing the midpoint between the ground surface and the ground-water table. Samples collected from the interval immediately above the ground-water table will be analyzed by IEA, Inc. for ~~Target Compound List~~ (TCL) volatile organic compounds (VOCs), TCL semi-VOCs (SVOCs), ~~Target Analyte List~~ (TAL) metals, ~~PCBs, pesticides, and PCDD/PCDFs~~. Samples collected from the interval representing the midpoint between the ground surface and the ground-water table will be analyzed by the laboratories for PCBs, PCDDs/PCDFs, and lead. Based on previous site investigations, the ground-water interface may range from 3 to 15 feet below grade. At locations where depth to ground water is shallow (less than 5 feet), a midpoint sample will not be collected. The analytical methods for the surface and subsurface soil samples are presented in Table 3.

All samples will be collected during the duration of this project as defined in Section 1.5 - Project Schedule.

2.1.2 Furnace Courtyard Area

Surface soil sampling will be conducted at two locations in the Furnace Courtyard Area. One sample will be obtained from one of several below ground equipment pits in Building 2. The exact pit to be sampled will be selected at the time of collection based on field observations of sediment present. The second surface soil sample will be collected at the specific location where the drum discharge conveyor entered the furnace (Figure 2). The 0- to 2-foot interval will be sampled and analyzed by the laboratory. The sample collected for VOCs will be taken at a depth greater than 6 inches below the ground surface.

As shown on Figure 2, subsurface soil sampling will occur at six spatially distributed locations surrounding the Furnace in the courtyard. At each location, samples will be collected for laboratory analysis from the two-foot intervals immediately above the ground-water table and from the two-foot interval representing the midpoint between the ground surface and the ground-water table. If the depth to ground water is shallow (less than 5 feet), no midpoint sample will be collected for analysis.

All samples collected from the Furnace Courtyard Area will be analyzed for TCL VOCs, TCL SVOCs, TAL metals, PCBs, pesticides, and PCDDs/PCDFs. All samples will be collected during a single sampling event.

2.1.3 Storage Tank Area

Surface and subsurface soil samples will be collected at a total of three locations (Figure 2) throughout the Storage Tank Area. Soil samples will be collected from the 0- to 2-foot interval representing the surface soils, from the 2-foot interval immediately above the ground-water table, and from the 2-foot interval representing the midpoint between the ground surface and the ground-water table. If the depth to ground water is shallow (less than 5 feet) no midpoint sample will be collected for analysis.

An additional surface soil sample (0- to 2-foot interval) will be collected from the collection sump of the concrete trough (Figure 2), identified by Bayonne Barrel and Drum Company as the oil/water separator.

All samples collected from the Storage Tank Area will be analyzed by IEA, Inc. for TCL VOCs, TCL SVOCs, TAL metals, PCBs, pesticides, and PCDDs/PCDFs. Samples for VOCs analysis of the surface soils will be collected at a depth greater than 6 inches below the ground surface. All samples will be collected during a single sampling event.

2.2 Sampling Equipment and Procedures

2.2.1 Surface Soils

Surface soil samples will be obtained from the Yard Area, Furnace Courtyard Area, and Storage Tank Area. Soil samples will be collected using either a hand-driven, split spoon sampler, a stainless steel bucket auger, or a spade or scoop as determined by the field team, depending on the material encountered. Sampling procedures at locations where both surface and subsurface soil samples will be collected will follow the procedures presented in Section 2.2.2. Samples will be collected to a pre-determined depth and analyzed for compounds of concern as detailed in Section 2.1 of this SAP. Sampling points in the Furnace Courtyard Area and the Storage Tank Area will be located in the field based on taped distance measurements from the existing building, fence posts, utility poles, etc. and documented in a field notebook for future reference. In the yard area, a grid will be established to locate the sampling points. Surface soil sampling will be conducted utilizing the materials and procedures outlined in Appendix B and shipped to the laboratory following the protocols in Appendix C. Volatile sample containers will be filled first with soil collected at a depth greater than 6 inches below the ground surface. The remaining sample will be homogenized prior to placement into appropriate sample containers.

Equipment cleaning will be performed at the beginning of the sampling event and between each separate sampling location as described in Appendix D - Field Cleaning/Decontamination Procedures. Materials and wastes (i.e., soil, water, disposal equipment, etc.) generated during the implementation of this SAP will be collected and disposed appropriately as discussed in Section 3.7.

2.2.2 Subsurface Soils

All subsurface soil samples will be collected using a Geoprobe® sampling technique. Using the Geoprobe®, borings are installed by driving 1-inch diameter stainless steel rods into the ground with a truck-mounted percussion hammer and hydraulic jack. Soil samples will be collected at discrete intervals and analyzed for compounds of concern, as discussed in Section 2.1 of this SAP. Prior to submission to the laboratory, subsurface soil samples will be screened with a PID to evaluate potential concentrations of constituents of concern. Sampling points will be located in the field based on taped distance measurements from the existing building, fence posts, utility poles, etc. and documented in a field notebook for future reference and preparation of a final report.

Geoprobe® soil sampling activities will be conducted utilizing the materials and procedures outlined in Appendix E. Subsurface soil samples will be screened with a PID following procedures outlined in Appendix F. The soil samples will be shipped to the laboratory following the protocols set forth in Appendix C. All equipment will be thoroughly cleaned between sample locations as described in Appendix D. Materials and wastes (i.e., soil, water, disposable equipment, etc.) generated during implementation of this SAP will be managed as discussed in Section 3.7.

3. Sample Handling and Analysis

3.1 Introduction

This section discusses and defines the field QA/QC procedures to be used during implementation of the Site Sampling and Analysis program. These procedures will work in conjunction with the QA/QC procedures contained in the QAPP developed for this project (Blasland, Bouck & Lee, Inc., November 1996).

3.2 Sampling Containers and Preservation

Appropriate sample containers, preservation methods, laboratory holding times and the analytical methods for the specific matrices are presented in Table 3.

The analytical laboratories will supply appropriate sample containers and preservative (as necessary). The field personnel will be responsible for properly collecting, labeling and preserving samples (as appropriate). Sample labeling procedures are described in Appendix C.

3.3 Packing, Handling, and Shipping Requirements

The filled, labeled, and sealed containers will be placed in a cooler on ice and carefully packed to reduce the possibility of container breakage.

All samples will be packaged by the field personnel and transported as environmental samples. The packaged samples will be transported to IEA, Inc. by courier (as needed) within 24 to 48 hours of sample collection. General procedures for packing, handling, and shipping environmental samples are included in Appendix C.

3.4 Sample Designations and Documentation

Field personnel will provide comprehensive documentation covering all aspects of field sampling, field analysis, and COC. This documentation constitutes a record which allows reconstruction of all field events to aid in data review, validation, and interpretation. All original documents, records, and information relating to the performance of the field work will be retained in a project file at the BBL office in Cranbury, New Jersey. The various forms of documentation which will be maintained throughout the sampling activities are briefly outlined below.

3.4.1 Daily Production Documentation

Each field crew will maintain a field logbook consisting of a waterproof, bound notebook which will contain a record of all activities performed at the site. The specific measurements from field testing and sampling will be recorded in the field logbook or on separate documentation forms. At the time of sampling, detailed notes of the sample location and observations will be recorded in the field logbook. Observations include a description of each sample increment (i.e., soil characteristics, color, coarseness, etc.).

3.4.2 Sampling Information

During sampling, detailed notes will be made as to the sample location, physical observations, sample depths, and weather conditions. These notes will be recorded in the field logbook, along with any field measurements. General sampling documentation information will include the field personnel, the location, date, collection technique, and sampling success.

3.4.3 Sample Designations

The matrix to be sampled during this investigation is soil. Samples will be identified with a unique designation system that will facilitate sample tracking. The sample designation system to be employed during the sampling activities will be consistent, yet flexible enough to accommodate unforeseen sampling events/conditions.

An alpha-numeric system will be used by field personnel to assign each sample with a unique sample identification number.

3.4.4 Field Equipment, Calibration, and Maintenance Logs

Calibration and maintenance of field instrumentation will be documented in the field logbook for each piece of field equipment.

3.5 Sample Chain-of-Custody

Persons will have custody of samples when the samples are in their physical possession, in their view after being in their possession, were in their physical possession and then placed in a secured location so the samples cannot be tampered with, or placed in a designated secure area. In addition, when samples are secured in a restricted area accessible only to authorized personnel, they will be deemed to be in the custody of such authorized personnel.

The COC forms will provide the record of responsibility for sample collection, transport, and submittal to the laboratory. The forms will be filled out at each sampling site, at a group of sampling sites, or at the end of each day for sampling by one of the field personnel designated to be responsible for sample custody. In the event that the samples are relinquished by the designated sampling person to other sampling or field personnel, the COC form will be signed and dated by the appropriate personnel to document the sample transfer. The original COC form will accompany the samples to the laboratory and copies will be forwarded to the BBL QAC. Additional discussion of sample and custody documentation are provided in the project QAPP.

3.6 Quality Control Samples

Diligent adherence to all standard operating procedures described in this SAP is necessary to achieve a high degree of confidence in the data generated from the field samples. The rationale for QC samples is provided in the project QAPP.

The following types of field QC samples will be included for samples requiring analyses for TCL VOCs, TCL SVOCs, TAL metals, PCDDs, PCDFs, Pesticides, PCBs, and lead:

Field Blanks: Samples of distilled/deionized water which have been poured over sampling equipment after decontamination procedures have been performed. These samples will be used to evaluate the effectiveness of the cleaning procedures used. As per NJDEP guidance (May 1992 Field Sampling Procedures Manual), one field blank per day of sampling will be collected and analyzed for all parameters.

Field Duplicates: Two samples collected from the same location at the same time. Field duplicates will be used to assess environmental variability and laboratory performance. Field duplicate sample containers will be labeled as ordinary field samples with their own separate unique identification. The samples will not be identified as duplicates, thus the laboratory will analyze them as "blind" audit samples. As per New Jersey Department of

Environmental Protection (NJDEP) guidance (May 1992 Field Sampling Procedures Manual), one blind duplicate will be collected for every twenty samples (5%). The samples will be analyzed for all parameters.

Trip Blanks: Samples are not required for non-aqueous samples as per NJDEP guidance (May 1992 Field Sampling Procedures Manual).

The frequency of required field QC sample is summarized in Table 2 for all parameters.

3.7 Management of Investigation Derived Materials and Wastes

The handling of investigation derived materials and wastes is discussed briefly below and will be performed in a manner acceptable to de maximis, inc. Any excess soil collected but not submitted for laboratory analyses will be placed back into the area from which is was obtained.

Disposable equipment and debris such as health and safety equipment, plastic sheeting, sampling equipment, and other equipment and/or sampling debris that has come into contact with the various matrices and not reused in the investigation will be collected in plastic bags during the samples events and placed into appropriately labeled containers within the fenced area of the Bayonne Barrel and Drum Site.

Decontamination rinsate (e.g., tap and distilled water containing small amounts of nitric acid) will be containerized at each sampling location or group of locations. Upon completion of the field activities, the rinsate and other field generated wastes will be stored within the fenced area of the Bayonne Barrel Drum Site for future disposal in accordance with applicable rules and regulations.

Tables

TABLE 1

BAYONNE BARREL AND DRUM SITE
NEWARK, NEW JERSEY

DATA QUALITY OBJECTIVES

Data Type	Investigation Objectives	Data Use(s)[1]	Reporting Levels
Soil			
Volatile Organics	- Define extent of contamination - Determine boundaries of affected areas - Identify concentration ranges present	SC	10% NJDEP Regulatory Package Balance NJDEP Reduced Deliverables
Semi-Volatile Organics	- Define extent of contamination - Determine boundaries of affected areas - Identify concentration ranges present	SC	
Pesticides/PCBs	- Define extent of contamination - Determine boundaries of affected areas - Identify concentration ranges present	SC	
Metals	- Define extent of contamination - Determine boundaries of affected areas - Identify concentration ranges present	SC	
PCDD/PCDF	- Define extent of contamination - Determine boundaries of affected areas - Identify concentration ranges present	SC	100% NJDEP Regulatory Package

Notes:

(1) Data Uses

SC Site Characterization

PCBs Polychlorinated biphenyls
PCDD/PCDF Polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans
TAL Target Analyte List
TCL Target Constituent List

TABLE 2

BAYONNE BARREL AND DRUM SITE
NEWARK, NEW JERSEY

DATA SUMMARY OF PLANNED ANALYSES (including QC)

Parameter	Environmental Sample Quantity	Field QC Analyses						Laboratory QC Sample						Total
		Trip Blank		Field Blank		Field Duplicate		Matrix Spike		Matrix Spike Dup.		Lab Duplicate		
		Freq.	No.	Freq.	Estimated No.	Freq.	No.	Freq.	No.	Freq.	No.	Freq.	No.	
Soil														
Volatile Organics	29	NA	--	1/day	2	1/20	2	1/20	2	1/20	2	NA	--	37
Semi-Volatile Organics	29	NA	--	1/day	2	1/20	2	1/20	2	1/20	2	NA	--	37
Pesticides/PCBs	29	NA	--	1/day	2	1/20	2	1/20	2	1/20	2	NA	--	37
PCBs	63	NA	--	1/day	4	1/20	4	1/20	4	1/20	4	NA	--	79
PCDD/PCDF	92	NA	--	1/day	5	1/20	5	1/20	5	1/20	5	NA	--	112
TAL Metals	29	NA	--	1/day	2	1/20	2	1/20	2	NA	--	1/20	2	37
Lead	63	NA	--	1/day	4	1/20	4	1/20	4	NA	--	1/20	4	79

Notes:

Dup	Duplicate
Freq.	Frequency
NA	Not Applicable
No.	Number
PCBs	Polychlorinated biphenyls
PCDD/PCDF	Polychlorinated dibenzo-p-dioxin/polychlorinated dibenzofuran
QC	Quality Control

TABLE 3

BAYONNE BARREL AND DRUM SITE
NEWARK, NEW JERSEY

SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Parameter	Method[1]	Bottle Type	Preservation	Holding Time[2]
Soil				
TCL Volatile Organics	SW-846 8240	125 ml glass jar with Teflon®-lined lid.	Cool to 4°C	14 days to analysis
TCL Semi-Volatile Organics	SW-846 8270	250 ml glass jar with Teflon®-lined lid.	Cool to 4°C	14 days to extraction, 40 days to analysis
TCL Pesticides/PCBs	SW-846 8081			
PCBs	SW-846 8081	250 ml glass jar with Teflon®-lined lid.	Cool to 4°C	14 days to extraction, 40 days to analysis
PCDD/PCDF	SW-846 8280	250 ml glass jar with Teflon®-lined lid.	Cool to 4°C	30 days to extraction, 45 days to analysis
TAL Metals (except mercury)	SW-846 6010	250 ml glass jar with Teflon®-lined lid.	Cool to 4°C	180 days to analysis
Mercury	SW-846 7471			28 days to analysis
Lead	SW-846 6010	250 ml glass jar with Teflon®-lined lid.	Cool to 4°C	180 days to analysis

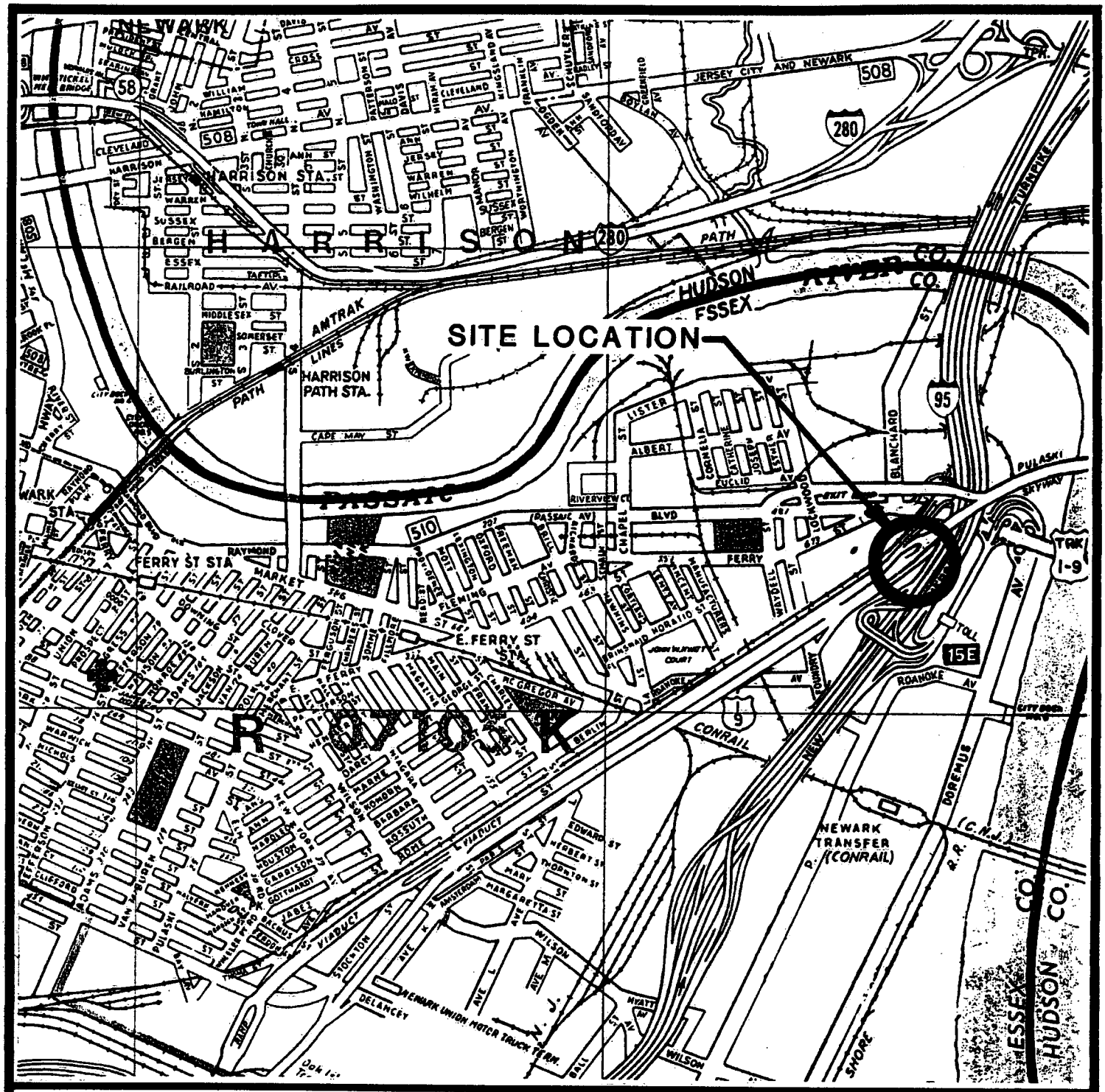
Notes:

(1) All methods are USEPA SW-846
(2) Holding times are from date of collection.

PCBs Polychlorinated biphenyls
TCL Target Constituent List
TAL Target Analyte List

U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Test Methods for Evaluating Solid Waste. SW-846 3rd ed. Washington, D.C. 1995.

Figures



SOURCE:

- HAGSTROM ESSEX COUNTY ATLAS
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BAYONNE BARREL AND DRUM COMPANY
NEWARK, NEW JERSEY

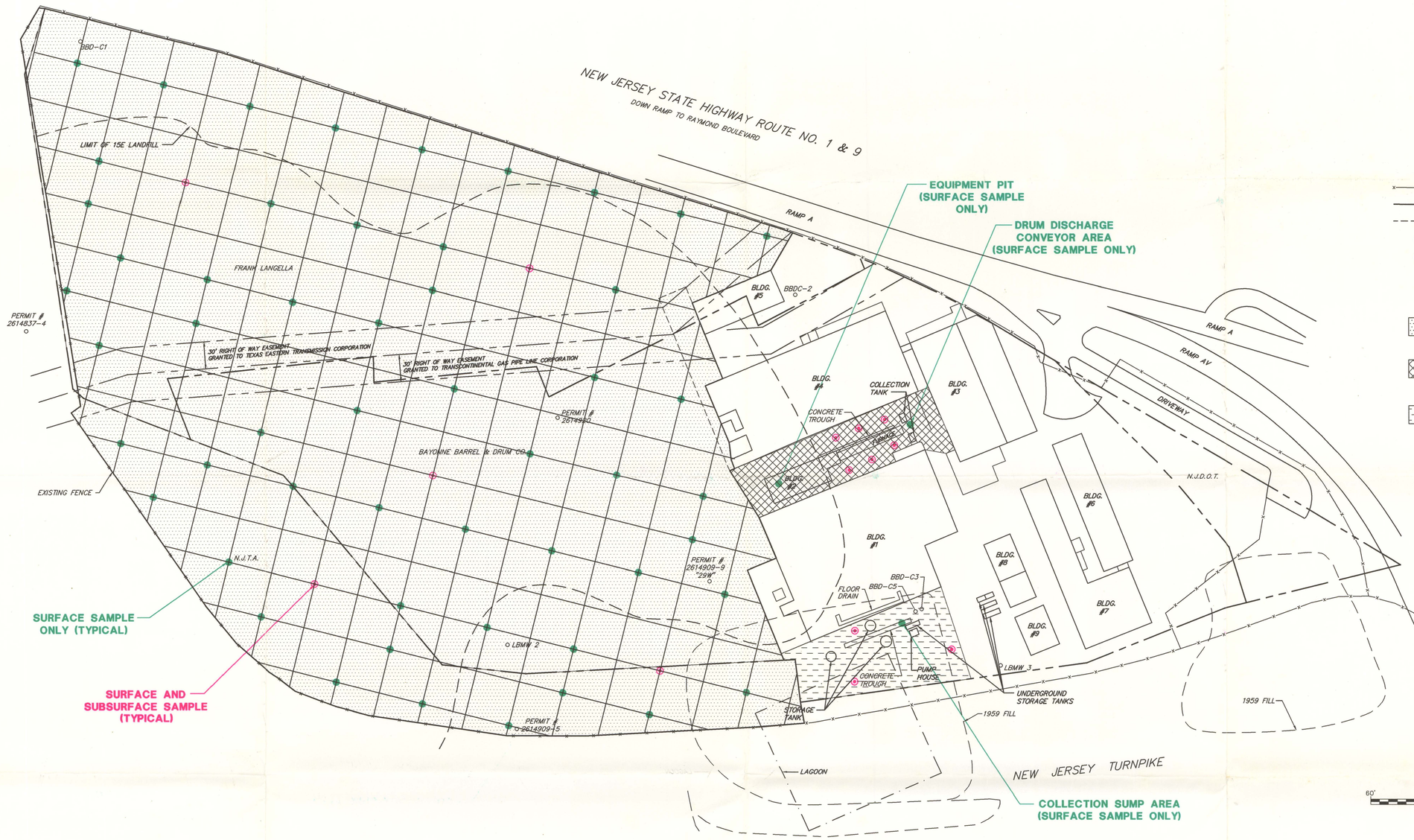
SAMPLING AND ANALYSIS PROGRAM

SITE LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 1

11/6/96 CRAN-62-W.D.N.
546.11.001



LEGEND

- EXISTING MONITORING WELL
- EXISTING FENCE
- PROPERTY LINE
- FILL AREA LIMIT LINE
- SURFACE SAMPLE LOCATION
- SURFACE AND SUBSURFACE SAMPLE LOCATION

YARD AREA
AREA = 488,164 S.F.
or 11.21 AC.+/-

FURNACE COURTYARD AREA
AREA = 14,739 S.F
or 0.34 AC.+/-

STORAGE TANK AREA
AREA = 15,608 S.F.
or 0.36 AC.+/-

NOTES:

DATA FOR THIS MAP COMPILED FROM DRAWINGS BY:

1. BORRIE, McDONALD & WATSON, SURVEYORS. FEBRUARY 29, 1972
2. DIVERSIFIED ENVIRONMENTAL RESOURCES. DECEMBER 29, 1989
3. SMC ENVIRONMENTAL SERVICES GROUP DECEMBER 31, 1991

60' 0 60' 120'
SCALE IN FEET

BAYONNE BARREL AND DRUM COMPANY
NEWARK, NEW JERSEY

SAMPLING AND ANALYSIS PROGRAM

PROPOSED SOIL SAMPLING LOCATIONS

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE 2

XREF: NONE
L: OFF=REF
P: STD-PCP/DL
NOVEMBER 6, 1996 CRAN-62-WDN
546\54611001\54611SM1.DWG

Appendices

APPENDIX A

Conceptual Sampling Plan

CONCEPTUAL SAMPLING PLAN

The Bayonne Barrel and Drum site is located at 150 Raymond Boulevard in the City of Newark, NJ. EPA has completed certain removal actions including: the removal of approximately 46,000 drums, some containing hazardous substances; testing segregating and over packing of hazardous substances; removal of dioxin and lead contaminated ash piles; and removal of tanks containing contaminated sludge. EPA has also conducted limited soil sampling in selected locations at the site which has confirmed the presence in site soils of various metals, inorganic and organic compounds and dioxin. In addition, there are historical data available relative to the site soils in reports prepared by Dan Raviv Associates, Inc., (1986) and Louis Berger Associates, Inc. (1986).

The work to be performed will include the planning and execution of an investigation to determine the nature and extent of soil contamination at the site. The locations at the site identified as requiring further investigation include: 1) the Yard Area (previously referred to as the drum storage area), 2) the Furnace Courtyard, and 3) the Storage Tank Area. These areas are identified on the attached figure, Proposed Sampling Locations.

YARD AREA

The Yard Area, previously referred to as the Drum Storage Area, is approximately 12 acres in area. It is the area of the site from which EPA performed the drum removal operation and contains the remaining ash pile. Based on well documented information, including historical aerial photographs, it is known that this area contains historic fill from the City of Newark 15E Landfill and other sources prior to operations by Bayonne Barrel and Drum Company. Also, aerial photography indicates that use of the Yard for the storage of ash occurred in the early 1980s only at a discrete location. EPA and others have identified the presence of PCBs, dioxin and lead in these surface soils.

To confirm and supplement the existing data, and to provide data in certain locations not previously sampled, sampling and analysis of the surface soils for PCBs, dioxin and lead will be performed. The 0 to 2-foot interval will be sampled at a minimum frequency of five (5) samples per acre. The sampling and analysis methods to be used may include the use of field analyses, such as Portable X-Ray Fluorescence (XRF) and colorimetric test kits. Laboratory analyzed samples will be analyzed in accordance with the New Jersey Reduced Data Deliverable QA/QC Package.

A limited number of samples (4-6) will also be collected from the subsurface soils to confirm and supplement the vertical extent of contamination. At each location samples will be collected for analysis from the two-foot interval immediately above the groundwater table, and from the two-foot interval representing the midpoint between

the ground surface and the groundwater table.
Samples collected from the interval immediately above the groundwater table will be analyzed for TCL organics, TAL metals, PCBs, pesticides and dioxin. Samples collected from the interval representing the midpoint between the ground surface and the groundwater table will be analyzed for PCBs, dioxin and lead utilizing the methods used for the surface soils, which may include field analyses if practicable. Approximately ten percent of the laboratory analyzed samples will be analyzed in accordance with the New Jersey Regulatory QA/AC Package capable of data validation, and the remaining laboratory samples will be analyzed in accordance with the New Jersey Reduced Data Deliverable QA/QC Package.

FURNACE COURTYARD AREA

A total of eight (8) locations are identified for sampling throughout the Furnace Courtyard Area.

Sampling will occur at six (6) spatially distributed locations surrounding the Furnace in the courtyard. At each location samples will be collected for analysis from the two-foot interval immediately above the groundwater table, and from the two-foot interval representing the midpoint between the ground surface and the groundwater table. Surface soils of the Furnace Courtyard Area have been extensively sampled and analyzed by EPA, therefore, it is not necessary to analyze the 0 to 2-foot surface soil interval with the exception as discussed below.

Surface soil sampling in the Furnace Courtyard Area will be conducted at two (2) locations. Building 2 contains several below ground equipment pits; one of these pits will be selected for sampling and analysis of the surface sediments. A surface soil sample will also be collected for analysis at the specific location where the drum discharge conveyor entered the furnace. The sample collected for volatile organics at these locations will be taken at a depth greater than 6 inches below the ground surface.

All samples collected from the Furnace Courtyard Area will be analyzed for TCL organics, TAL metals, PCBs, pesticides and dioxin. Approximately ten percent of the samples will be analyzed in accordance with the New Jersey Regulatory QA/QC Package, capable of data validation. The remaining samples will be analyzed in accordance with the New Jersey Reduced Data Deliverable QA/QC Package.

STORAGE TANK AREA

Sampling will occur throughout the Storage Tank Area at three (3) spatially distributed locations. At each location, samples will be collected for analysis from the 0 to 2-foot interval representing the surface soils, from the two-foot interval immediately

above the groundwater table, and from the two-foot interval representing the midpoint between the ground surface and the groundwater table. Samples for volatile organic analysis of the surface soils will be collected at a depth greater than 6 inches below the ground surface.

An additional surface soil sample (0 to 2-foot interval) will be collected from the collection sump of the concrete trough, identified by Bayonne Barrel and Drum Company as the oil/water separator.

All samples collected from the Storage Tank Area will be analyzed for TCL organics, TAL metals, PCBs, pesticides and dioxin. Approximately ten percent of the samples will be analyzed in accordance with the New Jersey Regulatory QA/QC Package, capable of data validation. The remaining samples will be analyzed in accordance with the New Jersey Reduced Data Deliverable QA/QC Package.

APPENDIX B

Surface Soil Sampling Procedures

APPENDIX B

Surface Soil Sampling Procedures

I. Surface Soil Sampling

Surface soil samples will be taken using a hand-driven, split-spoon sampler, a stainless steel bucket auger, or a stainless steel scoop, as determined by the field team and depending upon the subsurface material encountered.

II. Materials

The following materials, as required, will be available during surface soil sampling:

- Personal protective equipment (as required by the Health and Safety Plan)
- Cleaning equipment
- Aluminum or stainless steel tray
- Field notebook
- Appropriate sample containers and forms
- Insulated coolers with ice
- Split-spoon sampler
- Stainless steel bucket auger
- Brass push rod
- Spatula or knife
- 6-Foot rule and 100-foot measuring tape
- Stainless steel scoop
- Stainless steel spatulas
- Camera and film

III. Procedures

The following procedures will be employed to collect soil samples:

1. Don personal protective equipment (as required by the Health and Safety Plan).

2. Identify proposed sample location from the sample location plan and note location in field notebook.

3. Clean the sampling equipment in accordance with the procedures outlined in Appendix D of this SAP.

4. If the sample location is a vegetated area, the vegetation should be removed prior to collecting the soil sample(s).

5. At each sample location, advance a precleaned stainless steel bucket auger, split-spoon sampler, or stainless steel scoop with a straight, vertical entry into the soil, so as to secure a reasonably representative sample. Measure and record the depth of soil penetrated noting the beginning and end depth of the sample.

6. Remove the sampler and place on an aluminum or stainless steel tray.

7. With a precleaned spatula or knife remove all excess soil from the outside of the sampler to avoid cross contamination over the sample depth.

8. Extrude the sample onto a stainless steel tray. Describe and record sample descriptions. Mix sample increments thoroughly.

9. Place the sample in the appropriate sample jar. Volatile containers will be filled first prior to homogenization (if required).

10. Record all appropriate information in the field notebook per Section 3.4 of this SAP.

11. Labor, handle, pack, and ship the samples in accordance with the procedures outlined in Appendix C of this SAP.

APPENDIX C

Field Sample Packing, Handling, and Shipping Procedures

APPENDIX C

Field Sample Packing, Handling, and Shipping Procedures

I. Handling

1. Fill in sample label with:

   a. Sample type (sediment, surficial soil, soil, water, etc.);
   b. Project number and site name;
   c. Sample identification code and other sample identification information, if applicable;
   d. Analysis required;
   e. Date;
   f. Time sampled;
   g. Sample type (composite or discrete); and
   h. Preservative added, if applicable.

2. Cover the label with clear packing tape to secure the label onto the container.

3. Check the caps on the sample containers to ensure that they are tightly sealed.

4. Wrap the sample container cap with clear packing tape to prevent it from becoming loose.

5. Place a signed custody seal label over the cap such that the cap cannot be removed without breaking the custody seal.

6. Initiate chain-of-custody by designated sampling personnel responsible for sample custody (after sampling or prior to sample packing). Note: If the designated sampling person relinquishes the samples to other sampling or field personnel for packing or other purposes, the sampler will complete the chain-of-custody prior to this transfer. The appropriate personnel will sign and date the chain-of-custody form to document the sample custody transfer.

II. Packing

1. Using duct tape, secure the outside and inside of the drain plug at the bottom of the cooler that is used for sample transport.

2. Place each sample container or package in individual polyethylene bags (Ziploc^{R} type) and seal.

3. Place one to two inches of vermiculite at the bottom of the cooler as a cushioning material.

4. Place the sealed sample containers and package upright in the cooler.

5. Repackage ice (if required) in small Ziploc^{R} type plastic bags and place loosely in the cooler. Do not pack ice so tightly that it may prevent addition of sufficient cushioning material.

6. Fill the remaining space in the cooler with vermiculite.

7. Place the completed chain-of-custody forms in a large Ziploc[R] type bag and tape the forms to the inside of the cooler lid.

8. Close the lid of the cooler and fasten with duct tape.

9. Wrap strapping tape around both ends of the cooler at least twice.

10. Mark the cooler on the outside with the following information: shipping address, return address, "Fragile" labels on the top and on one side, and arrows indicating "This Side Up" (Attachment B-1) on two adjacent sides.

11. Place custody seals over the front right and back left of the cooler lid and cover with clear plastic tape.

III. Shipping

1. All samples will be hand delivered or delivered by an express carrier (i.e., Federal Express) within 48 hours or less from the date of sample collection.

2. The following chain-of-custody procedures will apply to sample shipping:

   a. Relinquish the sample containers to the laboratory via express carrier. The signed and dated forms should be included in the cooler. The express carrier will not be required to sign the chain-of-custody forms. The sampler should retain the express carrier receipt or bill of lading.

   b. When the samples are received by the laboratory, the laboratory personnel shall complete the chain-of-custody forms by recording receipt of samples, and then check the sample identification numbers on the containers to the chain-of-custody forms.

APPENDIX D

Field Cleaning/Decontamination Procedures

APPENDIX D

Field Cleaning/Decontamination Procedures

I. Materials

- Health and safety equipment (as required in the Health and Safety Plan);
- Distilled water;
- Non-phosphate soap (Alconox® or equivalent);
- Tap water;
- Rinse collection plastic containers;
- Knife;
- Brushes;
- Aluminum foil;
- Garbage bags;
- Spray bottles;
- Ziploc®type bags;
- Ten percent solution nitric acid; and
- Plastic sheeting.

II. Cleaning Procedures for Small Equipment and Sampling Devices

1. Follow health and safety procedures specified in the Health and Safety Plan.

2. Cleaning of reusable sampling equipment (e.g., scoops, mixing bowls, spatulas, etc.), will follow the decontamination procedures presented below:

   a. Non-phosphate detergent and distilled water wash;
   b. Distilled water rinse;
   c. Ten percent nitric acid solution rinse;
   d Distilled water rinse; and
   e Allow to air dry and wrap in aluminum foil.

3. Cleaning/decontamination will be conducted in plastic containers that will be transported to each sampling location. These containers will also be used to collect all decontamination rinsate.

III. Cleaning Procedures for Large Equipment (if applicable)

1. Follow health and safety procedures specified in the Health and Safety Plan.
2. Cleaning of large sampling equipment such as drill rigs, auger flights, drill rods, and drill bits, etc. will follow the decontamination procedures presented below:

   a. Wash all large equipment with a high pressure water wash using a brush as deemed necessary, to remove any particles.

Large sampling devices will be cleaned prior to mobilizing the site, after mobilizing to the site, between each sampling location while on site and prior to leaving the site.

APPENDIX E

Procedures for Soil Boring Completion and Sample Collection

APPENDIX E

Procedures for Soil Boring Completion and Sample Collection

I. Introduction

Soil borings will be completed with a Geoprobe™ sampling device to collect samples at discrete depth intervals.

II. Equipment Cleaning

Equipment will be cleaned prior to use on the site, between each drilling location, and prior to leaving the site. All drilling equipment and associated tools including augers, drill rods, sampling equipment, wrenches, and other equipment or tools that may have come in contact with soils and/or waste materials will be cleaned using a potable water source. The drilling equipment will be cleaned in an area adjacent to the work zone.

III. Drilling Procedures, Equipment, and Records

All equipment and materials that may be required to advance the soil borings and sample encountered materials, as described, will be available during the boring and sampling operations. Required equipment and materials include drilling machinery in good working order equipped for the season of operation; sample containers and forms; sampling, screening, and cleaning equipment and supplies; and supplies and equipment to comply with all site and Health and Safety procedures.

The Drilling Contractor will be responsible for obtaining accurate and representative samples, informing the field technician of changes in drilling pressure, and keeping a separate general log of soils encountered. Records will also be kept of occurrences of premature refusal due to boulders or construction materials which may have been used as fill. Where a boring cannot be driven to the desired depth, equipment will be relocated in order to obtain the required sample. Multiple refusals may lead to a decision by the field technician to abandon that sampling location.

The field technician will be responsible for documenting drilling events using a soil boring log (Attachment E-1) to record all relevant information in a clean and concise format. As an alternative, a bound field notebook may be used at the discretion of field personnel to document field activities, provided that the information shown on the Attachment E-1 is concisely presented in the notebook. The record of drilling events will include but not be limited to: 1) start and finish dates of drilling; 2) name and location of project; 3) project number, client, and site location; 4) sample number and depths; 5) blow counts and recovery; 6) depth to water; 7) type of drilling method; 8) auger size; 9) documentation of any elevated organic vapor emissions; 10) names of contractor's drillers, inspectors, or other people on site; and 11) weather conditions.

IV. Soil Sampling

Using the Geoprobe™, borings are installed by driving 1-inch diameter stainless steel rods into the ground with a truck-mounted percussion hammer and hydraulic jack. Soil samples are collected at discrete intervals using a 2-foot long, 1-inch outside diameter sample tube. When the closed sample tube is driven to the desired depth, an extension rod is lowered through the stainless steel rods to open the end of the

sample tube. After being opened, the sample tube is driven 2 feet to collect a soil sample, then retrieved by removing the probe rods.

Label sample containers and record all appropriate information in the field notebook per Section 3.4 of this SAP.

Those samples selected for laboratory analysis will be handled, packed, and shipped in accordance with the procedures set forth in Appendix C.

A technician will be on site during drilling and sampling operations to fully describe each soil sample on the soil boring log including:

1. Percent recovery;
2. Structure and degree of sample disturbance;
3. Soil type;
4. Color;
5. Moisture condition;
6. Density;
7. Grain size;
8. Consistency; and
9. Any other observations, particularly relating to the presence of waste materials or contaminants.

Particular care will be taken to fully describe any sheens observed, oil saturation, evidence of other organic chemicals, or unnatural materials.

V. Disposal Methods

All water generated during cleaning procedures will be collected and contained.

Personal protective equipment, such as gloves, disposable clothing, and other disposable equipment, resulting from personnel cleaning procedures and from soil sampling and handling activities, will be placed in plastic bags. These bags will be transferred into appropriately labeled 55-gallon drums or a covered roll-off box for appropriate disposal.

Soil materials will be placed back into the area from which it was obtained.

Upon completion of the field activities, the rinsate and other field generated wastes will be disposed as discussed in Section 3.7 of this SAP.

ATTACHMENT E-1

SOIL BORING LOG

Boring Number _____

Project Name & Location: Project Number:					Date & Time Started: _____ Date & Time Completed: _____
Drilling Company:		Foreman:			Sampler(s):
Drilling Equipment:		Method:			Elevation & Datum:
Bit(s):		Core Barrel(s):			Boring Location:
Sample Number	Sample Depth	Recovery (inches)	PID/FID (ppm)	Blow Counts	Soil Description

Remarks:

Page ___ of ___ Signature: _____ Date: _____

APPENDIX F

Photoionization Detector (PID) Field Screening Procedures

APPENDIX F

Photoionization Detector (PID) Field Screening Procedures

I. Introduction

Field screening with a photoionization detector (PID) is a procedure to measure relative concentrations of volatile organic compounds (VOCs) and other compounds. Field screening will be conducted in the headspace of soil samples (as described below) with the PID.

II. Materials

The following materials, as required, shall be available while performing PID field screening:

- Personal protective equipment (as required by the Health and Safety Plan);
- Field notebook;
- PID and operating manual;
- Calibration canisters for PID;
- Sample jars; and
- Aluminum foil.

III. Procedures

PID field instruments will be calibrated and operated to yield "total organic vapor" in ppm (v/v) as benzene. PID operation, maintenance, and calibration shall be performed in accordance with the manufacturer's instructions and entered in the field notebook.

Soil samples will be field screened upon collection with the PID for a relative measure of the total volatile organic concentration as specified in Section 2.2.2 of this SAP. PID readings will be recorded in the field notebook or the boring logs, whichever is appropriate.

1. Don personal protective equipment (as required by the Health and Safety Plan).

2. Fill a clean glass jar with the sample (if sufficient quantities of soil are available) to be analyzed. Quickly cover the open top with one or two sheets of clean aluminum foil and subsequently apply screw cap to tightly seal the jar;

3. Allow headspace development for at least ten minutes. Vigorously shake jar for 15 seconds both at the beginning and end of the headspace development period. Where ambient temperatures are below 32°F (0°C), headspace development should be within a heated building;

4. Subsequent to headspace development, remove screw cap to expose the foil seal. Quickly puncture foil seal with instrument sampling probe, to a point about one-half of the headspace depth. Exercise care to avoid contact with water droplets or soil particulates; and

5. Following probe insertion through foil seal, record the highest meter response for the sample as the jar headspace concentration. Using the foil seal/probe insertion method, maximum response should occur between two and five seconds. Erratic meter response may occur at high organic

vapor concentrations or conditions of elevated headspace moisture, in which case headspace data should be recorded and erratic meter response noted.